WEATHER IN THE UNITED STATES

GENERAL CONDITIONS

The month was warmer than usual over the greater part of the United States. The outstanding feature, judged by its effect in contributing to what appears to be the greatest flood in a century in the lower Mississippi, was the heavy rains of the month in the Ohio, Mississippi, and the lower Missouri Valleys, portions of which received from 100 to 300 per cent of the normal March precipitation. The heavy rains were confined to the interior valleys and the middle plateau and Rocky Mountain regions. Large areas in both the Atlantic and Pacific drainage had a pronounced shortage in precipitation. The usual details follow.—*A. J. H.*

CYCLONES AND ANTICYCLONES

By W. P. DAY

The great HIGH, which had been developing over the Canadian Northwest during the last days of February, moved slowly southeast during the first five days of March, and thereafter, until the 18th, high-pressure areas were of slight intensity and largely of Pacific origin. Between the 18th and the end of the month several HIGHS of the Hudson Bay, Alberta, and North Pacific types of moderate intensity were observed. There were 13 HIGHS in all.

Twenty-one low-pressure areas were tracked, but the only important storm occurred during the first three days of the month, a development over the Gulf, which moved northeast along the Atlantic coast in connection with the great HIGH over the interior.

THE WEATHER ELEMENTS

By P. C. Day, In Charge of Division

PRESSURE AND WINDS

March, 1927, had frequent changes in barometric pressure over the central and northern districts, but they were usually of only moderate importance; hence the winds were mainly light, and the stormy, blustery weather commonly associated with March was notably lacking, not only in the areas referred to above but in most other districts as well.

March opened with cyclonic conditions near the middle Gulf coast, attended by precipitation over an extensive area to the northward, and snow was falling over the northern portion of the area from the middle Missouri Valley southeastward to the elevated districts of the Carolinas and Georgia. By the morning of the 2d the storm had moved to the North Carolina coast, greatly increased in intensity, and unusually heavy snow for the region and season had fallen over the southern Appalachian Mountains and eastward nearly to the coast. The depths in North Carolina were particularly heavy, ranging up to 2 feet or more, in some instances the greatest depths ever recorded. High winds accompanied the storm as it approached the coast and much drifting of snow and interruption to traffic resulted for a short period. This storm moved northeastward into the ocean during the 3d, and snowfall did not extend north of the southern Chesapeake Bay region. The precipitation associated with this storm was generally heavy over the Gulf and South Atlantic States, New Orleans reporting more than 4 inches on the morning of the 1st.

The next important cyclone originated near the middle Rio Grande Valley on the 6th, and by the 7th had moved to the middle Mississippi Valley, attended by local thunderstorms and some heavy rains in northern Texas and portions of Arkansas and near-by areas. By the morning of the 8th the center had moved to the St. Lawrence Valley, and heavy rains had continued over portions of the area referred to above and extended into the Ohio Valley and near-by areas, while lighter falls had occurred over most other districts from the Mississippi River eastward, save along the South Atlantic and east Gulf coasts.

On the 9th and 10th a slight barometric depression passed over the Gulf and South Atlantic States attended by some heavy rains, and at the same time showers with local snows were rather general in the plateau region and to the westward. On the morning of the 11th a storm of moderate intensity was central over northwest Texas and snow was falling over much of the middle Rocky Mountains, and local heavy rains had occurred in western Kansas, the rain area extending into the southern plains. During the following two days the storm advanced through the middle Missouri Valley to the upper lake region and heavy rains occurred over extensive areas in the Mississippi and Ohio Valleys. At Memphis, Tenn., the total fall on the 11th and 12th was nearly 6 inches, and amounts from 1 to 2 inches or more occurred at numerous points in the area of heavy precipitation.

Some heavy rains occurred over a narrow area from northern Texas to the lower Lakes on the 18th and 19th. On the latter date a well-defined cyclone was central over New Mexico, whence it moved through the middle Mississippi Valley to the lower Lakes and North Atlantic coast during the following three days, attended by heavy rains over much of the central valleys and general rains over most of the country to the eastward, with more or less snow, glaze, or sleet over the northern portion of the precipitation area.

The last decade had rather frequent showers in the central valleys and some eastern districts, but the amounts were mainly small, except on the last day, when an extensive cyclone moving from the middle plateau was central over eastern Colorado and precipitation had extended well to the eastward of the center of low pressure. Heavy rains had fallen in the middle Mississippi Valley, and by the morning of April 1 the storm was central over eastern Missouri, attended by additional heavy rains in the middle Mississippi Valley and near-by areas, adding greatly to the flood conditions already threatening in that region. This storm moved eastward toward the Middle Atlantic States during the 2d, but with diminished precipitation.

Over the Pacific Coast States cyclonic storms were markedly infrequent and unimportant, and there was mainly little precipitation at any time during the month.

The most important anticyclone of the month covered the western plains at the beginning, and as it moved eastward, brought for a few days the coldest weather of the month to all districts from the Great Plains eastward. This was particularly effective in lowering the temperature over the Gulf and South Atlantic States, where freezing temperature extended to the coast lines and into the interior of the Florida Peninsula, considerable damage to vegetation occurring as far south as the Everglades. On account of rain and snow having recently preceded the change to colder weather, much damage resulted in the early fruit districts of the Southeast from water freezing in the open blossoms.

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A second important anticyclone moved into the Dakotas on the 19th and brought decidedly cold weather over the plains region and southern districts during the following two or three days. This anticyclone closely followed a precipitation area, which, moving northeastward over the central valleys, caused considerable snow, sleet, and glaze, as indicated elsewhere.

Mild anticyclonic conditions existed during much of the month over the eastern districts, and the average pressure for the month was highest and materially above normal over the Southeastern States, and generally lowest in the Southwest, though the average pressure there was mainly slightly above normal, and it was above in all other districts, save locally in North Dakota and the upper Missouri Valley and the adjacent areas of Canada.

Compared with February the average pressure was higher from the Mississippi Valley eastward and over the Pacific coast from central California to Washington and in Idaho. It was lower over the Great Plains and Rocky Mountains and most of the plateau region.

Local high winds were somewhat frequent during the first two decades, but there were few of these during the last third, and they were mainly absent from the Pacific coast region during the month. The details of the more important local storms appear at the end of this section.

TEMPERATURE

The unusual warmth that characterized the preceding months of January and February persisted throughout much of March from the Rocky Mountains eastward; indeed, over the Gulf States unusual warmth has continued since December, 1926, inclusive.

The month opened with decidedly cold weather over the Great Plains, zero temperatures extending southward into Oklahoma and northern Texas and freezing well toward the southern portion of the last-named State. This cold area gradually spread eastward during the following few days, carrying the line of freezing weather to the Gulf and South Atlantic coasts on the 2d and 3d and into the Florida Peninsula on the 3d and 4th.

Following this cold period there was a quick return to warmer, and by the 5th temperatures were above normal over much of the country from the Rocky Mountains eastward, though it still continued cool for the season over the more southeastern districts. With occasional slight variations from day to day, temperatures remained above normal almost continuously until near the end of the second decade, though over the more eastern portions unusual warmth continued into the beginning of the last decade.

Beginning with the 18th, colder weather set in over the upper Missouri Valley and during the following two days advanced southerly to the west Gulf States, freezing temperatures extending into western and central Texas, with the coldest weather of the month over most of the Rocky Mountain States. This cold area moved eastward during the following two or three days, bringing frosts and freezing temperatures to the central portions of the Gulf and South Atlantic States. During the remaining portions of the last decade the temperatures were mainly lower than normal over the entire eastern half of the country.

From the Rocky Mountains westward the temperatures were mainly below normal and there were frequent sharp falls over the plateau and Rocky Mountain States. No damaging cold occurred over the Pacific Coast States.

Some unusual warmth occurred over the central and eastern districts during the middle and latter portions of the second decade, and the highest temperatures ever observed so early in the month were recorded locally on the 16th to 18th in the upper lake region, Ohio Valley, and Southeastern States.

The warmest periods were observed in the upper Missouri Valley on the 14th and on successive dates to the eastward until the 19th and 20th as the warm area moved toward the Atlantic coast, though along the immediate coast the highest temperatures were observed about the 16th to 18th. West of the Rocky Mountains the warmest dates were mainly near the middle of the last decade.

The coldest periods were from the 1st to 4th over the Great Plains and thence eastward to the Atlantic coast, the morning of the 3d bringing severe and damaging frosts to nearly all parts of the Gulf and South Atlantic States and over much of the Florida Peninsula, early vegetables being severely injured in the Everglades district. In the Rocky Mountain region the lowest temperatures were about the 20th and 21st, but over the plateau and Pacific Coast States they were mostly during the early part of the month.

The average temperature for the month was above normal in practically all portions from the Missouri and Mississippi drainage areas eastward to the Atlantic coast and over the whole of Canada, as far as available observations disclose. The warmest portions, from 5° to 10° or more above, covered the area from the Missouri Valley eastward to New England and along the entire southern Canadian border, Winnipeg, Manitoba, reporting a positive departure in excess of 15°. From the Rocky Mountain region westward the average temperature was mostly lower than normal, though generally to a small extent only, slight excesses occurring in the central plateau.

PRECIPITATION

The rainfall was fairly well distributed in point of time, but very unevenly as to amounts.

In the central valleys, and notably in the States immediately bordering on the Mississippi River, precipitation was frequent and greatly in excess of the normal for March, particularly in the middle and southern portions, and at the close of the month that river was above flood stages from Cairo southward. Generally speaking, precipitation was in excess of normal, but to a much less degree, over nearly the entire Mississippi, Missouri, and Ohio watersheds, and in the middle Rocky Mountain and plateau regions as well. Precipitation was less than normal, but generally sufficient for current needs, over the east Gulf and Atlantic Coast States, the month being quite dry over the middle Atlantic coast section, and particularly so in portions of New Jersey where it was the driest March of record. Precipitation was below normal in the far Southwest, over the Pacific Coast States, and along the northern border from Washington to North Dakota.

SNOWFALL

The outstanding feature of the snowfall distribution was the large amount received on the 1st and 2d over portions of North Carolina and near-by areas, which, as stated elsewhere, was unusual not only as to the depths attained but for the lateness of occurrence in the locality referred to. Large local amounts were received in the Black Hills region at the close of March and the beginning of April, Rapid City reporting a depth of more than 18 inches, apparently the greatest single fall of record.

Considerable snow, sleet, or glaze occurred over the eastern portions of Nebraska and South Dakota and thence to near the southern end of Lake Michigan on the 19th and 20th, attended by heavy local damage to overhead-wire systems. Elsewhere east of the Rocky

Mountains the snowfall was mainly far less than is usually received in March.

In the western mountain districts the March snow was mainly near the normal, and on the whole the amounts stored in the high mountains at the end of the month gave promise of good supplies of water during the coming summer in practically every district where water for irrigation or power is a matter of great importance.

RELATIVE HUMIDITY

For the country as a whole the percentages of relative humidity were above normal, though there were sharp differences in the values at near-by points, notably in the Rocky Mountain region, where over the northern districts the percentages were frequently far below normal, while over the central portions they were as far above. Despite the great excess of precipitation over the middle and lower Mississippi Valley and near-by areas, the humidity percentages were only slightly above normal and occasionally even below.

The atmosphere was comparatively dry over the Florida Peninsula and portions of the Middle Atlantic States, coinciding with the general deficiency of precipitation over those regions.

SEVERE LOCAL STORMS, MARCH, 1927

[The table herewith contains such data as have been received concerning severe local storms that occurred during the month. A more complete statement will appear in the Annual Report of the Chief of Bureau]

Place	Date	Time	Width of path [1]	Loss of life	Value of property destroyed	Character of storm	Remarks	Authority
North Carolina and southeastern Virginia.	1–2			2		Severe snow and wind.	Considerable property damage; interruption or delay in travel for several days; about one-half of peach crop killed or injured.	Official, U. S. Weather Bureau.
Atlantic seaboard, Maryland to New England.	2					Gale	4 lightships blown from moorings; a freighter blown ashore and a steamer grounded.	Do.
Clearwater, Fla	3			1		Wind	Small building wrecked	Do.
Orleans, Mass	4			5		Gale	Schooner Montclair wrecked	New York Times (N. Y.).
Macoupin County, Ill. (southwest).	5					Electrical	Farm home damaged	Official, U. S. Weather Bureau.
Colfax, La	6	10 a. m.				Moderate hail	Young vegetables injured	Do.
Iola, Kans. (near)	7	Midnight–2 a. m.			$2,000	Violent wind	Farm buildings damaged; hay and fodder scattered; trees prostrated.	Do.
Troy and Banks, Ala	9	4 a. m.			10,000	Wind	Buildings damaged	Do.
Luling, Tex.	9	11:30 p. m.			23,000	do	Buildings and oil derricks badly damaged.	Do.
Manta, Ga	9					do	Several small houses demolished	Do.
Holton (near) and Netawaka (near), Kans.	11	5:30 p. m.	33		7,000	Tornado	No towns in path; farm buildings damaged	Do.
Hiawatha (near), Kans.	11	6 p. m.	1,760		3,000	Violent wind	Barns, outbuildings, and telephone poles blown down.	Do.
Wathena (near), Kans.	11	8 p. m.	150		1,500	Tornado	Barns and small buildings damaged	Do.
Aurora (near), Ill.	11	4:30–6 p.m.	16		150	Small tornado	Small structures and trees damaged	Do.
Memphis, Tenn.	11					Severe wind and rain.	Streets flooded; trees and light poles blown down.	Do.
Indianapolis, Ind.	12					Wind	Minor property damage reported	Do.
Alabama (northern) and Tennessee (western).	12–13					Heavy rains	Large areas flooded; railways suffer washouts; roads damaged; many families forced to leave homes.	Do.
Indiana	12–13					do	Extensive damage in some sections	Do.
Delight (near) to Collegeville (near), Ark.	17	7:30 p. m.	100	11		Tornado	About 3,000,000 feet of timber blown down; other property damaged; 28 persons injured.	Do.
DeLeon, Tex. (near)	17		3,520			Heavy hail	Roofs and auto tops pierced; poultry killed; cattle and other livestock badly burised; path 12 miles long.	Do.
Kremlin, Okla.	18	6–7:30 p.m.	8 mi.		150	Moderate hail	Minor damage	Do.
Carroll County, Ark.	18	7:30 – 8:30 p. m.	440	24	502,500	Tornado	Many houses demolished, others partially wrecked; barns and timber damaged; livestock killed; 108 persons injured.	Do.
Jerseyville, Ill. (3 miles north of).	18	11:55 p. m.	33		1,570	Small tornado	A farm house completely unroofed; path 500 feet long.	Do.
Bedford, Henderson, and Lewis Counties, Tenn.	18				20,000	Heavy hail	Many window panes broken; roofs damaged	Do.
Kay and Osage Counties, Okla.	18	10 p. m.			12,000	do	Damage chiefly confined to windows and roofs	Do.
Koskonong, Mo.	18				200	Hail	Windows and roofs damaged; fruit injured	Do.
Oklahoma (north-central)	18					Tornadic wind	Character of damage not reported	Do.
Oklahoma	18					Destructive hail	Property damage in various parts of the State	Do.
Petersburg, Ill.	18				500	Electrical	A church damaged	Do.
Bartlesville, Okla.	19	Midnight–1 a. m.				Moderate hail	Glass in greenhouses and residences broken	Do.
Kansas (southwest)	19	A. m.	50 mi.		20,800	Glaze	Damage chiefly to telephone and telegraph lines.	Do.
Jefferson, Osage, and Shawnee Counties, Kans.	19	3 p. m.	5 mi.		10,000	Heavy hail	Roofs pierced; crops not far enough advanced to be hurt.	Do.
Missouri (northern half)	19					Thunderstorms, wind, and hail.	Considerable damage to roofs and windows	Do.
Illinois (northern)	19–20					Glaze	Telegraph and telephone companies sustain heavy losses; much injury to trees.	Do.
Iowa (eastern)	19–20					do	Trolley service interrupted; overhead wire systems impaired.	Do.
Bolivar, Mo.	20				1,000	Thunderstorm and hail.	Houses swept from foundations	Do.
Corpus Christi, Tex.	20					Severe thunderstorm.	No details reported	Do.
Fort Wayne, Ind., and vicinity.	20				2,000	Glaze	Overhead wires damaged	Do.
Michigan (central and southwestern).	20					do	do	Do.
Mississippi (southern)	20					Wind	Character of damage not reported; 2 persons injured.	Do.
Mobile, Ala.	21	2 a. m.			250	Thundersquall	One building unroofed	Do.
Redding, Calif.	31	5:30 p. m.				Thunderstorm, wind, and hail.	Character of damage not reported	Do.
San Saba, Tex. (vicinity of)	29	5:30 p. m.	300			Wind and hail	Poles broken; crops and fruit trees injured; weak buildings damaged; 4 persons injured.	Do.
San Luis Obispo and Santa Barbara Counties, Calif.	29					Thunderstorm and hail.	Windows broken; trees stripped of foliage	Do.
Cartersville, La.	31	6 p. m.	800		1,000	Thundersquall	A store, 2 oil derricks, and timber blown down; 1 person injured; path 10 miles long.	Do.
Springfield, Ill., and vicinity.	31	11 p. m.				Wind	Minor damage reported	Do.
Rapid City, S. Dak.	31					Heavy snow	Roofs of several buildings collapsed; traffic obstructed.	Do.

[1] Yards when not otherwise specified; mi. signifies miles.